

NL020895  
13 Sep

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 904 717 B1

(12)

## EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention

of the grant of the patent:

11.07.2001 Bulletin 2001/28

(51) Int Cl.7: A47J 31/06

(21) Application number: 98203309.4

(22) Date of filing: 30.09.1998

(54) **Assembly for use in a coffee machine for preparing coffee, container and pouch of said assembly**

Baueinheit zum Einsatz in einem Kaffeebrühgerät, sowie deren Filterbehälter und Filterbeutel dafür

Unité d'extraction utilisé dans une machine à café, porte-filtre et sachet filtre faisant partie de cette unité

(84) Designated Contracting States:

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE

(30) Priority: 30.09.1997 NL 1007171

(43) Date of publication of application:

31.03.1999 Bulletin 1999/13

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**Description**

[0001] The invention relates to an assembly for use in a coffee machine for preparing coffee, comprising a container having a bowl-shaped inner space bounded by a bottom having at least one outlet opening and at least one vertical sidewall and, included in the inner space of the container, a pill-shaped pouch manufactured from filtering paper and filled with ground coffee, which pouch rests on the bottom and extends over the bottom to a position adjacent the at least one sidewall, while provided in the bottom are a number of channel-shaped grooves extending in radial direction of the bowl-shaped inner space to the at least one outlet opening and, in use, hot water is fed under pressure to a top side of the container by means of the coffee machine, causing the hot water to be pressed from a top side of the pouch through the pouch for extracting the ground coffee included in the pouch, the coffee extract formed flowing from a bottom side of the pouch and from the container via the at least one outlet opening.

[0002] The invention also relates to a pill shaped pouch manufactured from filtering paper and filled with ground coffee for preparing coffee in a coffee machine whereby, the pouch is arranged to be used in a container having a bowl-shaped inner space bounded by a bottom having at least one outlet opening and a vertical sidewall wherein the bottom consists of an outer horizontally directed annular bottom part bounding the sidewall and an inner saucer-shaped bottom part bounding an inner edge of the annular bottom part, the saucer-shaped bottom part adjacent the annular bottom part sloping downwards in a direction away from the sidewall wherein, in use, hot water is fed under pressure to a top side of the container by means of the coffee machine, causing the hot water to be pressed from a top side of the pouch through the pouch for extracting the ground coffee included in the pouch, the coffee extract formed flowing from a bottom side of the pouch and from the container via the at least one outlet opening.

[0003] Furthermore, the invention relates to a container for use in a coffee machine for preparing coffee, said container having a bowl-shaped inner space bounded by a bottom having at least one outlet opening and a vertical sidewall wherein, in use a pill-shaped pouch manufactured from filtering paper and filled with ground coffee, is included in the inner space and rests on the bottom and extends over the bottom to a position adjacent the sidewall, while provided in the bottom are a number of channel-shaped grooves extending in radial direction of the bowl-shaped inner space to the at least one outlet opening and wherein, in use, hot water is fed under pressure to a top side of the container by means of the coffee machine, causing the hot water to be pressed from a top side of the pouch through the pouch for extracting the ground coffee included in the pouch, the coffee extract formed flowing from a bottom side of the pouch and from the container via the at least one

outlet opening.

[0004] Such assembly is known from US Patent 3,620,155. The inner space of the container thereof is of rectangular design. From each corner point of the inner space, a groove extends to the outlet opening provided in the center of the bottom. The pouch is likewise of rectangular design and has dimensions corresponding to the dimensions of the inner space of the container. Accordingly, a circumferential edge of the pouch is located adjacent the vertical sidewall of the container.

[0005] A problem of the known assembly is that in use, a portion of the hot water that is poured onto the pouch flows along the side edge of the pouch to the end of a groove located at a corner point of the container.

[0006] This hot water then flows via the groove directly to the outlet opening. This involves a so-called bypass effect. As a consequence, not the complete amount of hot water that is fed at the top side of the container flows via the pouch to the outlet opening. Consequently, the coffee extract, which is for instance received in a container disposed under the outlet opening, is diluted with hot water. This will give the coffee extract an undesired strength. It is not possible to make allowance for the bypass effect during the preparation of coffee, because it is not known beforehand what amount of water will flow around the pouch and, via the grooves, to the outlet opening.

[0007] The object of the invention is to provide a solution to the problem posed, and accordingly, the invention is characterized in that each of said grooves extends from a position located at a distance from the sidewall in a direction away from the sidewall.

[0008] As the grooves do not extend to the sidewall, this has the surprising result that the bypass effect is substantially decreased. In accordance with a first further elaboration of the invention, it applies that the channel-shaped grooves extend in radial direction of the bowl-shaped inner space to the at least one outlet opening, each of said grooves extending from the position located at a distance from the sidewall in the direction of the at least one outlet opening. In particular, in this variant, the bypass effect proves to be negligibly small when it applies that the smallest distance between each of said grooves on one side and the sidewall on the other is greater than 10% of a maximum diameter of the inner space of the container.

[0009] Preferably, it applies that the smallest distance between each of said grooves on one side and the sidewall on the other is at least substantially equal to 20% of the maximum diameter of the inner space of the container.

[0010] The pouch extends to a position adjacent the vertical sidewall of the container. This means that it is essential to the invention that the dimensions of the pouch and the container be adjusted to each other. When the pouch is for instance of smaller design, the undesired bypass effect will occur in spite of the fact that said grooves extend from a position located at a dis-

tance from the sidewall in the direction of the at least one outlet opening. Hence, the invention is incorporated in the specific properties of the container and the specific dimensions of the pouch which correspond therewith.

[0010] In particular, a bottom of the pouch has a shape substantially corresponding to the shape of the bottom of the container. In that case, the extraction will be optimal and the bypass effect minimal.

[0011] The pouch comprises a disk-shaped top sheet and a disk-shaped bottom sheet which are interconnected adjacent their longitudinal edges, the interconnected parts of the top and bottom sheets forming an annular sealing seam.

[0012] The width of each of the grooves may vary from, for instance, 1 to 4 mm. In particular, the width approximately equals 2 mm. If the width of the grooves is chosen too great, this has as a consequence that a relatively large portion of the filtering area will be clear. This entails the risk of too little pressure being built up in the container and the flow of liquid through the filter becoming too great. This has a negative effect on the coffee-making efficiency.

[0013] When the assembly is used for preparing one or two cups of coffee, it applies that the diameter of the inner space of the container is approximately equal to 74 mm and that the diameter of the pouch is also approximately equal to 74 mm. Likewise, it applies that the diameter of a coffee bed formed in the pouch is in that case approximately equal to 61 mm. If the dimensions of the pouch are chosen to be different, i.e. greater or smaller, there is again the risk of bypass. Moreover, it has been found that in that case the coffee-making efficiency is not optimal, either. In accordance with a second further elaboration of the invention, it applies that the bottom is provided with a number of vertical projections which are arranged at regular distances relative to each other, said projections being formed by the inter-spaces formed between the vertical projections.

[0014] It is observed that US Patent 5,287,797 also discloses a container in which a pouch can be included for preparing coffee. The container comprises a bottom having vertical ribs. This arrangement implies that between the ribs recesses are present whose lowest point is formed by the bottom of the container. However, these recesses are so wide that no bottom having grooves is involved here. Indeed, the surface area covered by the recesses is greater than the surface area covered by the ribs. In accordance with the invention, however, it applies that the area of the grooves is smaller than the area of those parts of the bottom where no grooves are provided. Hence, in the above US patent, no grooves according to the present invention are involved.

[0015] NL-A-9400837 discloses an assembly for use in a coffee machine comprising a container and a rectangular pouch filled with ground coffee. The bottom which supports the pouch is however flat and comprises a plurality of openings. The inner space of the container

is not bowl-shaped and the bottom does not comprise grooves.

[0016] DE-A-9403616 discloses a container for use in a coffee machine, wherein the container comprises a bottom with labyrinth-shaped grooves. The grooves do not extend from a position located at a distance from the sidewall in a direction away from the sidewall.

[0017] The pouch according to the invention is characterised in, that the diameter of the inner space of the container is approximately equal to 74 mm, and the diameter of the inner saucer-shaped bottom part is approximately 61 mm and that the pouch comprises a disk-shaped top sheet and a disk-shaped bottom sheet which are interconnected adjacent their longitudinal edges, the interconnected parts of the top and bottom sheets forming an annular sealing seam wherein the diameter of the pouch is approximately equal to 74 mm, and the diameter of a coffee bed formed in the pouch is approximately equal to 61 mm, so that the annular sealing seam has dimensions substantially corresponding to the dimensions of the annular bottom part and dimensions of the disk-shaped bottom sheet from a center of the sheet to the annular sealing seam correspond to dimensions of the saucer-shaped bottom part. The container according to the invention is characterised in that each of said grooves extends from a position located at a distance from the sidewall in a direction away from the sidewall.

[0018] The container according to the invention is characterized in that each of said grooves extends from a position located at a distance from the sidewall in a direction away from the sidewall.

[0019] The invention will now be specified with reference to the accompanying drawings. In these drawings:

- 35 Fig. 1 is a top plan view of a first embodiment of a container according to the invention;
- 36 Fig. 2 is a cross section taken on the line II-II of Fig. 1;
- 37 Fig. 3 shows an enlarged part of Fig. 2;
- 38 Fig. 4 is a cross section of a pouch taken on the line IV-IV of Fig. 5, associated with the container according to Figs. 1-3;
- 39 Fig. 5 is a top plan view of the pouch according to Fig. 4;
- 40 Fig. 6 is a cross section of an assembly according to the invention, consisting of the container of Figs. 1-3 and the pouch of Figs. 4 and 5;
- 41 Fig. 7 is a top plan view of a second embodiment of a container according to the invention;
- 42 Fig. 8 is a cross section of the container according to Fig. 7;
- 43 Fig. 9 is a side elevation of the container according to Fig. 7; and
- 44 Fig. 10 shows a projection of the container according to Fig. 7.

[0020] An assembly 1 according to the invention for

use in a coffee machine for preparing coffee comprises a container 2 (see Figs. 1-3 and Fig. 6) and a pouch 4 (see Figs. 5-6) included in an inner space 6 of the container 2. The inner space 6 is of bowl-shaped design and is bounded by a bottom 8 and at least one vertical sidewall 10. Because in this example, the inner space 6 and the pouch 4 are of cylindrical design, this implies that the container 2 in fact only comprises a single vertical cylindrical sidewall 10 which is round and closed in itself.

[0021] Located in the bottom 8 is at least one and in this example only one outflow opening 12. Further provided in the bottom are a number of channel-shaped grooves 14 extending in radial direction of the inner space 6 to the outlet opening 12. The grooves each have a bottom 16 sloping down in the direction of the outlet opening 12. In this example, each bottom 16 of a groove 14 makes an angle  $\alpha$  relative to the vertical which is equal to approximately  $85^\circ$ . It further applies that the grooves in this example each have a rectangular cross section. However, this is not necessarily the case. Other shapes are possible as well.

[0022] Each of the grooves 14 extends from a position 18 located at a distance from the sidewall 10 in the direction of the outlet opening 12. The total area occupied by the grooves is smaller than the total area of the bottom 8 that is not occupied by the grooves 14. In this example, the container is provided with 12 grooves, adjacent grooves enclosing an angle  $\beta$  of about  $30^\circ$ .

[0023] The pouch 4 (see Figs. 4 and 5) is pill-shaped and manufactured from filtering paper and filled with ground coffee. The pouch comprises a disk-shaped top sheet 20 manufactured from filtering paper and a disk-shaped bottom sheet 22 likewise manufactured from filtering paper. The disk-shaped bottom sheet and the disk-shaped top sheet are interconnected adjacent the longitudinal edges 24, the interconnected parts of the top and bottom sheets forming an annular sealing seam 26.

[0024] When the pouch 4 is inserted into the container 2 (see Fig. 6), it extends over the bottom 8 of the container 2 to a position adjacent the vertical sidewall 10 of the container 2 (see also Fig. 6). In this example, it applies that the smallest distance  $d$  between each of said grooves 14 on one side and the vertical sidewall 10 on the other is greater than 10% of the maximum diameter  $D$  of the inner space of the container 2. In this example, it even applies that the smallest distance  $d$  between each of said grooves 14 on one side and the vertical sidewall 10 on the other is at least substantially equal to 20% of the maximum diameter  $D$  of the inner space of the container 2.

[0025] The bottom 8 comprises an outer horizontal annular bottom part 28 bounding the sidewall 10. The bottom 8 further comprises an inner saucer-shaped bottom part 30 bounding an inner edge 32 of the annular bottom part 28. Adjacent the annular bottom part 28, the saucer-shaped bottom part 30 slopes downwards in a

direction away from the sidewall. In this example, the grooves extend exclusively in the saucer-shaped bottom part. More in particular, it applies in this example that each of said grooves extends from a position 18 located at a distance from the inner edge 32 of the annular bottom part 28 in the direction of the outlet opening 12. The container is preferably dimensioned such that the smallest distance  $d'$  between each of said channels 14 on one side and the inner edge 32 of the annular bottom part 28 on the other is greater than 10% of the maximum diameter  $D'$  of the saucer-shaped bottom part 30.

[0026] Provided in the center of the saucer-shaped bottom part 30 is a recess 34, with the outlet opening 12 being located in a bottom 36 of the recess 34. The pouch preferably has a bottom which in this example is formed by the bottom sheet 22 whose shape substantially corresponds to the shape of the bottom 8 of the container.

[0027] In use, the pouch 4 is inserted into the container 2, as shown in Fig. 6. The assembly 1 is then inserted into a coffee machine known per se. The coffee machine comprises a cover 38 closing off the assembly 1 as soon as it has been placed in the machine. The cover 38 comprises an opening 40 through which, via a hose 42, hot water can be fed to the inner space 6 of the container. Adjacent its circumferential edge, the cover further comprises a sealing ring 44 closed in itself.

[0028] The sealing seam 26 of the pouch 4 is located between the sealing ring 44 and the annular bottom part 28. When, in use, hot water is subsequently fed to the inner space 6 of the assembly via the hose 42, a pressure is created in the inner space 6. Due to this pressure, the sealing ring 44 moves outwards in radial direction to sealingly abut against the vertical sidewall 10. Next, the hot water will penetrate into the pouch 4 via the top sheet 20. In the pouch 4, the coffee extract is then formed. This coffee extract will subsequently leave the pouch again via the bottom sheet 22. In particular in places where the grooves 14 are present, the coffee extract can flow from the pouch. In positions between the grooves 14, little or no extract will in principle flow from the pouch. The effect thus achieved is that the hot water does not flow through the pouch too fast. This again results in that the coffee-making efficiency will be optimal.

[0029] The coffee extract ending up in the grooves 14 will subsequently flow to the recess 34 and leave the container 2 via the outlet opening 12. Under the container 2, a cup can for instance be placed which is filled with the coffee extract. As the channel-shaped grooves 14 slope downwards in the direction of the recess 34, a proper flow through the pouch is promoted. It is also guaranteed that no bypass occurs. This means that the hot water fed to the container does not flow to the outlet opening 12 without moving through the coffee bed included in the pouch. This is guaranteed in that in accordance with the invention, said grooves extend from a position 18 located at a distance from the sidewall in

the direction of the outlet opening. Where no grooves are present, the bottom of the pouch 4 directly rests on the bottom of the container 8. Hence, at these positions, the hot water can hardly flow from the pouch, if at all. This implies that at first, no water can flow from the outlet opening 12 from a top side of the pouch through the sealing seam of the pouch. If this actually happened, pure water, i.e. no coffee extract, would flow to the outlet opening 12, causing a bypass effect. The coffee extract received in a cup would then be diluted with hot water.

**[0030]** Because according to the present embodiment, it applies that the smallest distance  $d$  between each of the grooves on one side and the vertical sidewall on the other is greater than 10% of the maximum diameter  $D$  of the inner space of the container, it is guaranteed that the bypass effect will at least substantially not occur.

**[0031]** If the hot water flowed through the coffee bed at a position located adjacent the sealing seam 26, the effect occurring would be that the coffee-making efficiency is not optimal. After all, at this position, the height of the coffee bed is relatively low, so that the flow-through will be relatively fast. Moreover, the flow of liquid chooses the path of least resistance, so that a disproportionately large part of the hot water will flow through this portion of the coffee bed. As in accordance with the invention, it further applies that the smallest distance  $d'$  between each of the grooves on one side and the inner edge of the annular bottom part on the other is greater than 10% of the maximum diameter  $D'$  of the annular bottom part 28, it is provided that this effect does not occur and the coffee-making efficiency is in fact optimal. As it is, the channel-shaped grooves 14 do not extend to positions where the coffee bed of the pouch 4 is relatively thin. As the bottom of the pouch has a shape substantially corresponding to the shape of the bottom of the container, said dimensions of the grooves 14 can be optimally utilized. Because it applies in particular that the dimensions of the bottom disk-shaped sheet 22 from a center of the sheet to the annular sealing seam correspond to the dimensions of the saucer-shaped bottom part 30, it applies that said optimum extraction efficiency is achieved. It also applies that the annular sealing seam has dimensions substantially corresponding to the dimensions of the annular bottom part. This also implies that a pouch inserted into the container is optimally and unequivocally positioned in the container. The pouch as it were automatically searches the position in which it is supposed to be located.

**[0032]** In this example, the assembly is intended for preparing one cup of coffee. For that reason, the diameter of the inner space of the container is approximately equal to 74 mm. To effect that the bypass effect does not occur, it applies that the diameter of the pouch is also approximately equal to 74 mm. Of course, the other above-discussed conditions should be met as well in order to minimize the bypass effect. It further applies that the diameter of a coffee bed formed in the pouch is ap-

proximately equal to 61 mm. This diameter corresponds to the diameter of the annular bottom part 28. This diameter, too, is particularly suitable for preparing one cup of coffee. Since the two diameters are chosen to be equal, it moreover applies that when the above conditions are also met, the bypass effect is minimized, while the coffee-making efficiency is maximized.

**[0033]** The invention is by no means limited to the embodiment of the container outlined hereinabove. Figs. 7-9 show an alternative embodiment of the container. Parts corresponding to those of the container which is discussed with reference to Figs. 1-6 are provided with identical reference numerals.

**[0034]** The container entirely corresponds to the container discussed with reference to Figs. 1-6, the difference being that the grooves 14 are shaped differently. In this example, however, it applies that the bottom is provided with a number of vertical projections arranged at regular distances relative to each other. The grooves 14 are formed by the interspaces formed between the vertical projections 46. In this example, the vertical projections 46 are substantially of cylindrical design. As is clearly visible in Fig. 7, the projections are arranged in rows and columns relative to each other. As a result, the channel-shaped grooves formed between the projections are in parallel and perpendicular arrangement relative to each other.

**[0035]** It further applies that at the bottom side 50 of the projections, the interspaces 48 formed between the projections cover 75-94% of the total surface area of the bottom that is provided with projections. Hence, this involves a total area of the saucer-shaped bottom part 30, less the portion of the saucer-shaped bottom part which, adjacent the annular bottom part 28, slopes downwards in a direction away from the sidewall.

**[0036]** It further applies that in this example, the projections have their top sides provided with a round tip. The operation of the container according to Figs. 7-10 is completely analogous with that of the container according to Figs. 1-6. In the container of Figs. 7-9, the pouch of Fig. 4 can be placed. Also, the cover 38 can be used for closing off the container, the sealing ring 44 again being located within the vertical sidewall 10 of the container of Figs. 7-10.

**[0037]** In accordance with another variant of the invention, the container may be provided with a larger number of projections 46 than shown in Figs. 7-10. In that case, however, the projections may have a much smaller cross section.

**[0038]** In the embodiment outlined with reference to Figs. 7-10, it applies that the center-to-center distance of the projections is 3-5 mm, in particular about 4.2 mm. The radius  $r$  adjacent the bottom side of the projections may vary from, for instance, 0.5 to 2 mm and is in this example about 1 mm. Such variants are each understood to fall within the framework of the invention.

**[0039]** As discussed hereinabove, the invention relates to a container on one side and a pouch on the oth-

er, optimally adjusted to each other. Hence, the invention is embodied both in the container and in the pouch. As the container has a diameter of 74 mm, the pouch will have to have an at least substantially equal diameter. Accordingly, such pouch is understood to fall within the framework of the invention.

### Claims

1. An assembly (1) for use in a coffee machine for preparing coffee, comprising a container (2) having a bowl-shaped inner space (6) bounded by a bottom (8) having at least one outlet opening (12) and a vertical sidewall (10) and, included in the inner space (6) of the container, a pill-shaped pouch (4) manufactured from filtering paper and filled with ground coffee, which pouch rests on the bottom (8) and extends over the bottom (8) to a position adjacent the sidewall (10), while provided in the bottom (8) are a number of channel-shaped grooves (14) extending in radial direction of the bowl-shaped inner space (6) to the at least one outlet opening (12) and, in use, hot water is fed under pressure to a top side of the container (2) by means of the coffee machine causing the hot water to be pressed from a top side of the pouch through the pouch for extracting the ground coffee included in the pouch, the coffee extract formed flowing from a bottom side of the pouch and from the container via the at least one outlet opening, **characterized in that** each of said grooves extends from a position (18) located at a distance from the sidewall (10) in a direction away from the sidewall (10).
2. An assembly according to claim 1, characterized in that the channel-shaped grooves (14) extend in radial direction of the bowl-shaped inner space to the at least one outlet opening (12), each of said grooves (14) extending from the position (18) located at a distance from the sidewall (10) in the direction of the at least one outlet opening (12).
3. An assembly according to claim 2, characterized in that the smallest distance between each of said grooves (14) on one side and the sidewall (10) on the other is greater than 10% of a maximum diameter of the inner space of the container (2).
4. An assembly according to claim 3, characterized in that the smallest distance between each of said grooves (14) on one side and the sidewall (10) on the other is at least substantially equal to 20% of the maximum diameter of the inner space of the container (2).
5. An assembly according to claim 1, characterized in that the bottom (8) is provided with a number of vertical projections (16) arranged at regular distances relative to each other, said grooves (14) being formed by the inter spaces (49) formed between the vertical projections (46).
6. An assembly according to claim 5, characterized in that the vertical projections (46) are substantially cylindrical.
7. An assembly according to claim 5 or 6, characterized in that the projections (46) are arranged in rows and columns relative to each other.
8. An assembly according to any one of preceding claims 5-7, characterized in that at the bottom side (50) of the projections, the interspaces formed between the projections cover 75-94% of the total area of the bottom that is provided with projections.
9. An assembly according to any one of preceding claims 5-8, characterized in that the projections (46) have their top sides provided with round tips.
10. An assembly according to any one of the preceding claims, characterized in that the bottom (8) consists of an outer horizontally directed annular bottom part (28) bounding the sidewall (10) and an inner saucer-shaped bottom part (30) bounding an inner edge (32) of the annular bottom part (28), the saucer-shaped bottom part (30) adjacent the annular bottom part (28) sloping downwards in a direction away from the sidewall (10).
11. An assembly according to claim 10, characterized in that the grooves (14) extend in the saucer-shaped bottom part (30).
12. An assembly according to claim 11, characterized in that each of the grooves (14) extends from a position (18) located at a distance from the inner edge (32) of the annular bottom part (28) in the direction of the at least one outlet opening (12).
13. An assembly according to claim 12, characterized in that the smallest distance between each of said grooves (14) on one side and the inner edge (32) of the annular bottom part (28) on the other is greater than 10% of a maximum diameter of the annular bottom part (30).
14. An assembly according to any one of preceding claims 2-4, characterized in that the grooves (14) have a rectangular cross section.
15. An assembly according to claims 10-13, characterized in that in the center of the saucer-shaped bottom part (30), a recess (34) is provided, the at least one outlet opening (12) being located in a bottom

- (36) of the recess (34).
16. An assembly according to any one of the preceding claims, characterized in that a bottom (22) of the pouch (4) has a shape substantially corresponding to the shape of the bottom (8) of the container (2). 5
17. An assembly according to any one of the preceding claims, characterized in that the pouch (4) comprises a disk-shaped top sheet (20) and a disk-shaped bottom sheet (22) which are interconnected adjacent their longitudinal edges, the interconnected parts of the top and bottom sheets forming an annular sealing seam (26). 10
18. An assembly according to claims 10 and 17, characterized in that dimensions of the disk-shaped bottom sheet (22) from a center of the sheet (22) to the annular sealing seam (26) correspond to dimensions of the saucer-shaped bottom part (30). 15
19. An assembly according to claim 18, characterized in that the annular sealing seam (26) has dimensions substantially corresponding to the dimensions of the saucer-shaped bottom part (30). 20
20. An assembly according to any one of preceding claims 17-19, characterized in that the diameter of the inner space (6) of the container is approximately equal to 74 mm and that the diameter of the pouch (4) is approximately equal to 74 mm. 25
21. An assembly according to any one of preceding claims 17-20, characterized in that the diameter of the inner space (6) of the container (2) is approximately equal to 74 mm and that the diameter of a coffee bed formed in the pouch is approximately equal to 61 mm. 30
22. An assembly according to any one of the preceding claims, characterized in that the inner space (6) of the container (2) is cylindrical, an axial axis of the inner space (6) being at least substantially vertically directed. 35
23. A pill shaped pouch (4) manufactured from filtering paper and filled with ground coffee for preparing coffee in a coffee machine whereby, the pouch is arranged to be used in a container (2) having a bowl-shaped inner space (6) bounded by a bottom (8) having at least one outlet opening (12) and a vertical sidewall (10) wherein the bottom (8) consists of an outer horizontally directed annular bottom part (28) bounding the sidewall (10) and an inner saucer-shaped bottom part (30) bounding an inner edge (32) of the annular bottom part (28), the saucer-shaped bottom part (30) adjacent the annular bottom part (28) sloping downwards in a direction away from the sidewall (10), characterised in that, the diameter (D) of the inner space (6) of the container is approximately equal to 74 mm, and the diameter (D') of the inner saucer-shaped bottom part is approximately 61 mm and that the pouch (4) comprises a disk-shaped top sheet (20) and a disk-shaped bottom sheet (22) which are interconnected adjacent their longitudinal edges, the interconnected parts of the top and bottom sheets forming an annular sealing seam (26) wherein the diameter of the pouch (4) is approximately equal to 74 mm., the diameter of a coffee bed formed in the pouch is approximately equal to 61 mm., the annular sealing seam (26) has dimensions substantially corresponding to the dimensions of the annular bottom part (28) and wherein dimensions of the disk-shaped bottom sheet (22) from a center of the sheet (22) to the annular sealing seam (26) correspond to dimensions of the saucer-shaped bottom part (30) wherein a bottom of the pouch (4), which bottom is formed by the bottom sheet (22), comprises a shape substantially corresponding to the shape of the bottom (8) of the container. 40
24. A container (2) for use in a coffee machine for preparing coffee, said container (2) having a bowl-shaped inner space (6) bounded by a bottom (8) having at least one outlet opening (12) and a vertical sidewall (10) wherein, in use a pill-shaped pouch (4) manufactured from filtering paper and filled with ground coffee, is included in the inner space and rests on the bottom (8) and extends over the bottom (8) to a position adjacent the sidewall (10), while provided in the bottom (8) are a number of channel-shaped grooves (14) extending in radial direction of the bowl-shaped inner space (6) to the at least one outlet opening (12) and wherein, in use, hot water is fed under pressure to a top side of the container (2) by means of the coffee machine, causing the hot water to be pressed from a top side of the pouch through the pouch for extracting the ground coffee included in the pouch, the coffee extract formed flowing from a bottom side of the pouch and from the container via the at least one outlet opening, characterised in that each of said grooves extends from a position (18) located at a distance from the sidewall (10) in a direction away from the sidewall (10). 45
- Patentansprüche
1. Baueinheit (1) zum Einsatz in einem Kaffeekochgerät, die einen Behälter (2) mit einem becherförmigen Innenraum (6) enthält, der von einem Boden (8) umrandet wird, der mindestens eine Auslassöffnung (12) aufweist, und eine vertikale Seitenwand (10) besitzt, die in dem becherförmigen Innenraum

- (6) des Behälters angeordnet ist, sowie einen becherförmigen Filtereinsatz (4), der aus einem Filterpapier hergestellt ist und mit gemahlenem Kaffee gefüllt wird, wobei dieser Filtereinsatz auf dem Boden (8) aufliegt und sich über diesen Boden in eine Position an der Seitenwand (10) erstreckt, und bei der in diesem Boden (8) eine Anzahl von rillenförmigen Nuten (14) vorgesehen ist, die in radialer Richtung aus dem becherförmigen Innenraum (6) zu mindestens einer der Auslassöffnung (12) verlaufen, und im Gebrauch wird mit Hilfe der Kaffeemaschine heißes Wasser unter Druck an der Oberseite des Behälters (2) so eingefüllt, dass das Wasser von der Oberseite des Filtereinsatzes durch diesen Filtereinsatz gepresst wird, um das in dem Filtereinsatz enthaltene Kaffeemehl zu extrahieren, so dass der hergestellte Kaffeeextrakt aus dem Boden des Filtereinsatzes und dem Behälter über mindestens eine der Auslassöffnungen herausfließen kann,  
**dadurch gekennzeichnet, dass**  
die einzelnen Nuten zwischen einer Position (18), die im Abstand von der Seitenwand (10) liegt, und einer Richtung angeordnet sind, die sich von der Seitenwand (10) entfernt.
2. Baueinheit nach Anspruch 1,  
**dadurch gekennzeichnet, dass**  
die rillenförmigen Nuten (14) in radialer Richtung zwischen dem becherförmigen Innenraum und mindestens einer Auslassöffnung (12) verlaufen, wobei jede dieser Nuten (14) zwischen der im Abstand von der Seitenwand (10) liegenden Position (18) in die Richtung von mindestens einer Auslassöffnung verläuft.
3. Baueinheit nach Anspruch 2,  
**dadurch gekennzeichnet, dass**  
der kleinste Abstand zwischen den einzelnen Nuten (14) an der einen Seite und der Seitenwand (10) an der anderen Seite um 10 % größer ist, als der maximale Durchmesser des Innenraums des Behälters (2).
4. Baueinheit nach Anspruch 3,  
**dadurch gekennzeichnet, dass**  
der kleinste Abstand zwischen den einzelnen Nuten (14) an der einen Seite und der Seitenwand (10) an der anderen Seite mindestens 20 % des maximalen Durchmessers des Innenraums des Behälters (2) entspricht.
5. Baueinheit nach Anspruch 1,  
**dadurch gekennzeichnet, dass**  
der Boden (8) mit einer Serie von senkrechten Vorsprüngen (16) ausgestattet ist, die untereinander in gleichmäßigem Abstand angeordnet sind, wobei diese Nuten (14) durch die Zwischenräume (49)
- zwischen den senkrechten Vorsprüngen (46) gebildet werden.
6. Baueinheit nach Anspruch 5,  
**dadurch gekennzeichnet, dass**  
diese senkrechten Vorsprünge (46) weitgehend zylindrisch ausgebildet sind.
7. Baueinheit nach einem der Ansprüche 5 oder 6,  
**dadurch gekennzeichnet, dass**  
diese Vorsprünge (46) untereinander in Reihen und Kolonnen angeordnet sind.
8. Baueinheit nach einem der Ansprüche 5 bis 7,  
**dadurch gekennzeichnet, dass**  
an der unteren Seite (50) dieser Vorsprünge die zwischen diesen Vorsprüngen bestehenden Zwischenräume 75 - 94 % des Gesamtbereiches des Bodens überdecken, der mit diesen Vorsprüngen ausgestattet ist.
9. Baueinheit nach einem der vorausgegangenen Ansprüche 5 bis 8,  
**dadurch gekennzeichnet, dass**  
die oberen Ränder dieser Vorsprünge (46) abgerundet ist.
10. Baueinheit nach einem der vorausgegangenen Ansprüche,  
**dadurch gekennzeichnet, dass**  
der Boden (8) aus einem horizontal nach außen gerichteten ringförmigen Bodenteil (28), welcher die Seitenwand (10) umrundet, und einem inneren flachen Bodenteil (30) besteht, welcher einen inneren Rand (32) des ringförmigen Bodenteils (28) umrundet, wobei der flache Bodenteil (30) an dem ringförmigen Bodenteil (28) nach unten gegen die Seitenwand (10) geneigt ist.
11. Baueinheit nach Anspruch 10,  
**dadurch gekennzeichnet, dass**  
die Nuten (14) in einem flachen Bodenteil (30) angeordnet sind.
12. Baueinheit nach Anspruch 11,  
**dadurch gekennzeichnet, dass**  
die einzelnen Nuten (14) zwischen einer Position (18), die im Abstand von der Innenkante (32) des ringförmigen Bodenteils (28) liegt, in Richtung mindestens einer der Auslassöffnungen (12) angeordnet sind.
13. Baueinheit nach Anspruch 12,  
**dadurch gekennzeichnet, dass**  
der kleinste Abstand zwischen diesen Nuten (14) an der einen Seite und der Innenkante (32) des ringförmigen Bodenteils (28) an der anderen Seite um 10 % größer ist, als der maximale Durchmesser des

- ringförmigen Bodenteils (30).
- 14.** Baueinheit nach einem der vorausgegangenen Ansprüche 2 bis 4,  
**dadurch gekennzeichnet, dass**  
die Nuten (14) einen rechteckigen Querschnitt haben.
- 15.** Baueinheit nach einem der Ansprüche 10 bis 13,  
**dadurch gekennzeichnet, dass**  
im Zentrum des flachen Bodenteils (30) eine Vertiefung (34) vorgesehen ist, wobei mindestens eine der im Boden (36) angeordneten Auslassöffnungen (12) in dieser Vertiefung (34) angeordnet ist.
- 16.** Baueinheit nach einem der vorausgegangenen Ansprüche,  
**dadurch gekennzeichnet, dass**  
der Boden (22) des Filtereinsatzes (4) eine Form hat, die weitgehend der Form des Bodens (8) des Behälters (2) entspricht.
- 17.** Baueinheit nach einem der vorausgegangenen Ansprüche,  
**dadurch gekennzeichnet, dass**  
der Filtereinsatz (4) eine scheibenförmige obere Lage (20) und eine scheibenförmige untere Lage (22) aufweist, die an ihren Längskanten miteinander verbunden sind, wobei diese miteinander verbundenen oberen und unteren Lagen eine ringförmige Abdichtung (26) bilden.
- 18.** Baueinheit nach einem der Ansprüche 10 und 17,  
**dadurch gekennzeichnet, dass**  
die Abmessungen der scheibenförmigen unteren Lage (22) zwischen dem Zentrum der unteren Lage (22) und der ringförmigen Abdichtung (26) den Abmessungen des flachen Bodenteils (28) entsprechen.
- 19.** Baueinheit nach Anspruch 18,  
**dadurch gekennzeichnet, dass**  
die ringförmige Abdichtung (26) Abmessungen aufweist, die weitgehend den Abmessungen des ringförmigen Bodenteils (28) entsprechen.
- 20.** Baueinheit nach einem der vorausgegangenen Ansprüche 17 bis 19,  
**dadurch gekennzeichnet, dass**  
der Durchmesser des Innenraums (6) des Behälters etwa 74 mm beträgt und der Durchmesser des Filtereinsatzes (4) etwa 74 mm beträgt.
- 21.** Baueinheit nach einem der vorausgegangenen Ansprüche 17 bis 20,  
**dadurch gekennzeichnet, dass**  
der Durchmesser des Innenraums (6) des Behälters (2) etwa 74 mm beträgt und der Durchmesser
- 5 der in dem Filtereinsatz vorhandenen Kaffeemasse etwa 61 mm beträgt.
- 22.** Baueinheit nach einem der vorausgegangenen Ansprüche,  
**dadurch gekennzeichnet, dass**  
der Innenraum (6) des Behälters (2) eine zylindrische Form hat und dass eine axial verlaufende Achse des Innenraums (6) mindestens weitgehend senkrecht liegend angeordnet ist.
- 23.** Ein becherförmiger Filtereinsatz (4), der aus einem Filterpapier hergestellt wird und mit gemahlenem Kaffee für die Herstellung von Kaffee in einem Kaffeefüllgerät gefüllt ist, wobei dieser Filtereinsatz so angeordnet ist, dass er in einem Behälter (2) eingesetzt werden kann, welcher einen Innenraum (6) aufweist, der von einem Boden (8) umrundet wird, der mindestens eine Auslassöffnung (12) und eine senkrechte Seitenwand (10) aufweist, wobei der Boden (8) aus einem horizontal nach außen gerichteten ringförmigen Bodenteil (28), der die Seitenwand (10) umrundet, sowie aus einem inneren flachen Bodenteil (30) besteht, welcher die Innenkanne (32) des ringförmigen Bodenteils (28) umgibt, wobei sich der becherförmige Bodenteil (30) an dem ringförmigen Bodenteil (28) in unterer Richtung von der Seitenwand (10) weg bewegt, dadurch gekennzeichnet, dass  
der Durchmesser (D) des Innenraums (6) des Behälters etwa 74 mm beträgt, und der Durchmesser (D') des inneren flachen Teils etwa 61 mm beträgt und der Filtereinsatz (4) eine scheibenförmige Oberseite (20) und eine scheibenförmige Unterseite (22) aufweist, die an ihren Längskanten miteinander verbunden sind, wobei die miteinander verbundenen oberen und unteren Seiten eine ringförmige Abdichtung (26) bilden, in welcher der Durchmesser des Filtereinsatzes (4) etwa 74 mm beträgt, und der Durchmesser des in dem Filtereinsatz hergestellten Kaffeebettes etwa 61 mm beträgt, und die ringförmige Abdichtung (26) eine Abmessung hat, welche weitgehend den Abmessungen des ringförmigen Bodenteils entspricht, und die Abmessungen des scheibenförmigen Bodenteils (22) zwischen dem Zentrum der unteren Scheibe (22) und der ringförmigen Abdichtung (26) den Abmessungen des flachen Bodenteils (30) entsprechen, wobei der Boden des Filtereinsatzes (4), welcher aus dem Bodenteil (22) besteht, eine Form hat, die weitgehend der Form des Bodens (8) des Behälters entspricht.
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24. Behälter (2) für den Einsatz in einer Kaffeemaschine für die Zubereitung von Kaffee, in der dieser Behälter (2) einen becherförmigen Innenraum (6) aufweist, der von einem Boden (8) umrundet wird, der mindestens eine Auslassöffnung (12) und eine

senkrechte Seitenwand (10) aufweist, und bei der im Gebrauch ein becherförmiger Filtereinsatz (4), der aus einem Filterpapier hergestellt ist und mit gemahlenem Kaffee befüllt ist, in diesen Innenraum eingesetzt wird, und auf dem Boden (8) aufliegt und sich über diesen Boden (8) in eine Position an der Seitenwand (10) erstreckt, wobei in diesem Boden (8) eine Anzahl von rillenförmigen Nuten (14) angeordnet ist, die in radialer Richtung von dem Innenraum (6) des Behälters zu mindestens einer der Auslassöffnungen (12) verlaufen, und bei dem im Gebrauch heißes Wasser unter Druck an die Oberseite des Filtereinsatzes durch diesen Filtereinsatz geleitet wird, um das in dem Filtereinsatz enthaltene Kaffeemehl zu extrahieren, wobei der hergestellte Kaffeeextrakt aus der Unterseite des Filtereinsatzes und dem Behälter mindestens über eine dieser Auslassöffnungen abfließen kann,  
**dadurch gekennzeichnet, dass**  
 die einzelnen Nuten in einer Position (18) angeordnet sind, die im Abstand von der Seitenwand (10) in einer Richtung entfernt von der Seitenwand (10) vorgesehen ist.

#### Revendications

1. Ensemble (1) destiné à une utilisation dans une machine à café destinée à préparer le café, comprenant un récipient (2) comportant un espace intérieur en forme de bol (6) limité par une partie inférieure (8) comportant au moins une ouverture de sortie (12) et une paroi latérale (10) et, inclus dans l'espace intérieur (6) du récipient, un sachet en forme de pilule (4) fabriqué à partir de papier filtre et rempli de café moulu, lequel sachet reposant sur la partie inférieure (8) et s'étendant sur la partie inférieure (8) jusqu'à une position adjacente à la paroi latérale (10), tandis que dans la partie inférieure (8) sont formées un certain nombre de rainures en forme de canal (14) s'étendant en direction radiale de l'espace intérieur en forme de bol (6) vers la au moins une ouverture de sortie (12) et, en utilisation, de l'eau chaude est amenée sous pression à un côté supérieur du récipient (2) au moyen de la machine à café, provoquant le fait que l'eau chaude est pressée depuis le côté supérieur du sachet à travers le sachet en vue d'extraire le café moulu compris dans le sachet, l'extrait de café formé s'écoutant à partir d'un côté inférieur du sachet et à partir du récipient par la au moins une ouverture de sortie, caractérisé en ce que chacune desdites rainures s'étend à partir d'une position (18) située à une certaine distance de la paroi latérale (10) dans une direction s'éloignant de la paroi latérale (10).
2. Ensemble selon la revendication 1, caractérisé en ce que les rainures en forme de canal (14) s'éten-
- 5 dent en direction radiale de l'espace intérieur en forme de bol vers la au moins une ouverture de sortie (12), chacune desdites rainures (14) s'étendant à partir de la position (18) située à une certaine distance de la paroi latérale (10) dans la direction de la au moins une ouverture de sortie (12).
- 10 3. Ensemble selon la revendication 2, caractérisé en ce que la distance la plus petite entre chacune desdites rainures (14) sur un premier côté et la paroi latérale (10) sur l'autre est supérieure à 10 % d'un diamètre maximal de l'espace intérieur du récipient (2).
- 15 4. Ensemble selon la revendication 3, caractérisé en ce que la distance la plus petite entre chacune desdites rainures (14) sur un premier côté et la paroi latérale (10) sur l'autre est au moins sensiblement égale à 20 % du diamètre maximal de l'espace intérieur du récipient (2).
- 20 5. Ensemble selon la revendication 1, caractérisé en ce que la partie inférieure (8) est munie d'un certain nombre de saillies verticales (16) mutuellement disposées à des distances régulières, lesdites rainures (14) étant formées par les espacements (49) formés entre les saillies verticales (46).
- 25 6. Ensemble selon la revendication 5, caractérisé en ce que les saillies verticales (46) sont sensiblement cylindriques.
- 30 7. Ensemble selon la revendication 5 ou 6, caractérisé en ce que les saillies (46) sont mutuellement agencées en rangées et colonnes.
- 35 8. Ensemble selon l'une quelconque des revendications précédentes 5 à 7, caractérisé en ce qu'au niveau du côté inférieur (50) des saillies, les espacements formés entre les saillies recouvrent 75 à 94 % de l'aire totale de la partie inférieure qui est munie de saillies.
- 40 9. Ensemble selon l'une quelconque des revendications précédentes 5 à 8, caractérisé en ce que les saillies (46) ont leurs côtés supérieurs munis d'extrémités arrondies.
- 45 10. Ensemble selon l'une quelconque des revendications précédentes, caractérisé en ce que la partie inférieure (8) est constituée d'une partie inférieure extérieure annulaire dirigée horizontalement (28) limitant la paroi latérale (10) et une partie inférieure intérieure en forme de soucoupe (30) limitant un bord intérieur (32) de la partie inférieure annulaire (28), la partie inférieure en forme de soucoupe (30) adjacente à la partie inférieure annulaire (28) s'inclinant vers le bas dans une direction s'éloignant de
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- la paroi latérale (10).
11. Ensemble selon la revendication 10, caractérisé en ce que les rainures (14) s'étendent dans la partie inférieure en forme de soucoupe (30).
12. Ensemble selon la revendication 11, caractérisé en ce que chacune des rainures (14) s'étend à partir d'une position (18) située à une certaine distance du bord intérieur (32) de la partie inférieure annulaire (28) dans la direction de la au moins une ouverture de sortie (12).
13. Ensemble selon la revendication 12, caractérisé en ce que la distance la plus petite entre chacune desdites rainures (14) sur un premier côté et le bord intérieur (32) de la partie inférieure annulaire (28) sur l'autre est supérieure à 10 % d'un diamètre maximal de la partie inférieure annulaire (30).
14. Ensemble selon l'une quelconque des revendications 2 à 4, caractérisé en ce que les rainures (14) présentent une section transversale rectangulaire.
15. Ensemble selon les revendications 10 à 13, caractérisé en ce que, au centre de la partie inférieure en forme de soucoupe (30), un évidement (34) est prévu, la au moins une ouverture de sortie (12) étant située dans une partie inférieure (36) de l'évidement (34).
16. Ensemble selon l'une quelconque des revendications précédentes, caractérisé en ce qu'une partie inférieure (22) du sachet (4) présente une forme correspondant sensiblement à la forme de la partie inférieure (8) du récipient (2).
17. Ensemble selon l'une quelconque des revendications précédentes, caractérisé en ce que le sachet (4) comprend une feuille supérieure en forme de disque (20) et une feuille inférieure en forme de disque (22) qui sont reliées mutuellement de façon adjacente à leurs bords longitudinaux, les parties reliées mutuellement des feuilles supérieure et inférieure formant un joint d'étanchéité annulaire (26).
18. Ensemble selon les revendications 10 et 17, caractérisé en ce que les dimensions de la feuille inférieure en forme de disque (22) à partir d'un centre de la feuille (22) vers le joint d'étanchéité annulaire (26) correspondent aux dimensions de la partie inférieure en forme de soucoupe (30).
19. Ensemble selon la revendication 18, caractérisé en ce que le joint d'étanchéité annulaire (26) présente des dimensions correspondant sensiblement aux dimensions de la partie inférieure annulaire (28).
20. Ensemble selon l'une quelconque des revendications 17 à 19, caractérisé en ce que le diamètre de l'espace intérieur (6) du récipient est approximativement égal à 74 mm et en ce que le diamètre du sachet (4) est approximativement égal à 74 mm.
21. Ensemble selon l'une quelconque des revendications 17 à 20, caractérisé en ce que le diamètre de l'espace intérieur (6) du récipient (2) est approximativement égal à 74 mm et en ce que le diamètre d'un lit de café formé dans le sachet (4) est approximativement égal à 61 mm.
22. Ensemble selon l'une quelconque des revendications précédentes, caractérisé en ce que l'espace intérieur (6) du récipient (2) est cylindrique, un axe axial de l'espace intérieur (6) étant dirigé au moins sensiblement verticalement.
23. Sachet en forme de pilule (4) fabriqué à partir de papier filtre et rempli de café moulu en vue de préparer du café dans une machine à café d'où il résulte que le sachet est agencé pour être utilisé dans un récipient (2) comportant un espace intérieur en forme de bol (6) limité par une partie inférieure (8) comportant au moins une ouverture de sortie (12) et une paroi latérale verticale (10), où la partie inférieure (8) est constituée d'une partie inférieure extérieure annulaire dirigée horizontalement (28) limitant la paroi latérale (10) et une partie inférieure intérieure en forme de soucoupe (30) limitant un bord intérieur (32) de la partie inférieure annulaire (28), la partie inférieure en forme de soucoupe (30) adjacente à la partie inférieure annulaire (28) s'inclinant vers le bas dans une direction éloignée de la paroi latérale (10), caractérisé en ce que le diamètre (D) de l'espace intérieur (6) du récipient est approximativement égal à 74 mm, et le diamètre (D') de la partie inférieure intérieure en forme de soucoupe est approximativement égal à 61 mm et en ce que le sachet (4) comprend une feuille supérieure en forme de disque (20) et une feuille inférieure en forme de disque (22) qui sont reliées mutuellement de façon adjacente à leurs bords longitudinaux, les parties reliées mutuellement des feuilles supérieure et inférieure formant un joint d'étanchéité annulaire (26), où le diamètre du sachet (4) est approximativement égal à 74 mm, le diamètre d'un lit de café formé dans le sachet est approximativement égal à 61 mm, le joint d'étanchéité annulaire (26) présente des dimensions correspondant sensiblement aux dimensions de la partie inférieure annulaire (28) et où les dimensions de la feuille inférieure en forme de disque (22) depuis un centre de la feuille (22) vers le joint d'étanchéité annulaire (26) correspondent aux dimensions de la partie inférieure en forme de soucoupe (30) où une partie inférieure du sachet (4), laquelle partie inférieure

est formée par la feuille inférieure (22), comprend une forme correspondant sensiblement à la forme de la partie inférieure (8) du récipient.

24. Récipient (2) destiné à une utilisation dans une machine à café en vue de préparer du café, ledit récipient (2) comportant un espace intérieur en forme de bol (6) limité par une partie inférieure (8) comportant au moins une ouverture de sortie (12) et une paroi latérale verticale (10) dans lequel, en utilisation, un sachet en forme de pilule (4) fabriqué à partir de papier filtre et rempli de café moulu, est compris dans l'espace intérieur et repose sur la partie inférieure (8) et s'étend sur la partie inférieure (8) jusqu'à une position adjacente à la paroi latérale (10), tandis que dans la partie inférieure (8) sont formées un certain nombre de rainures en forme de canal (14) s'étendant en direction radiale de l'espace intérieur en forme de bol (6) vers la au moins une ouverture de sortie (12) et dans lequel, en utilisation, de l'eau chaude est amenée sous pression à un côté supérieur du récipient (2) au moyen de la machine à café, provoquant le fait que l'eau chaude est pressée depuis un côté supérieur du sachet à travers le sachet pour extraire le café moulu compris dans le sachet, l'extrait de café formé s'écoulant depuis un côté inférieur du sachet et depuis le récipient par la au moins une ouverture de sortie, caractérisé en ce que chacune desdites rainures s'étend à partir d'une position (18) située à une certaine distance de la paroi latérale (10) dans une direction s'éloignant de la paroi latérale (10).

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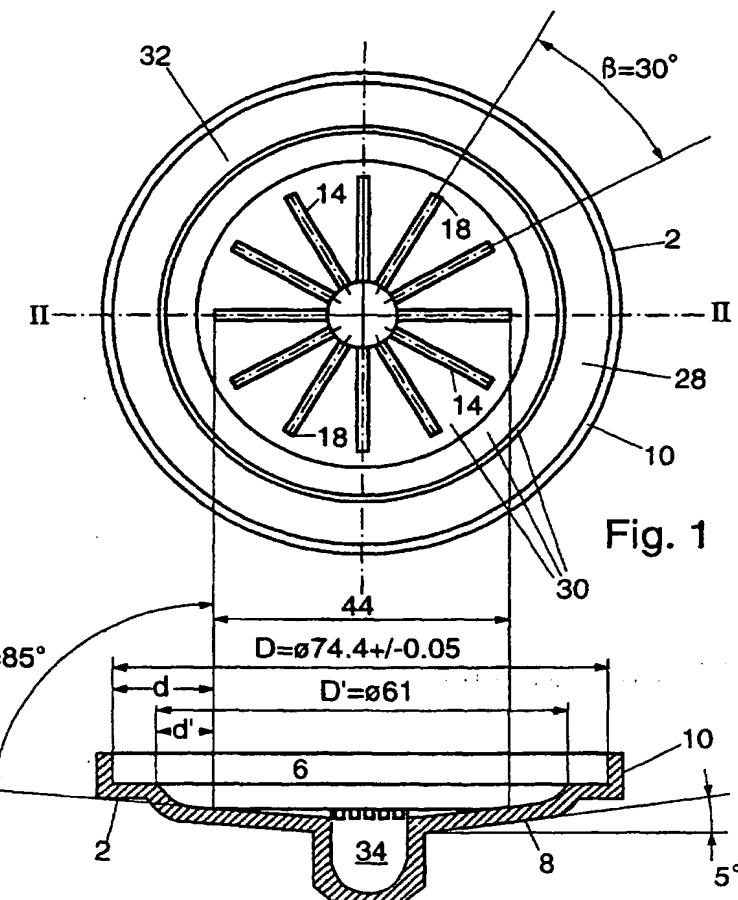


Fig. 2

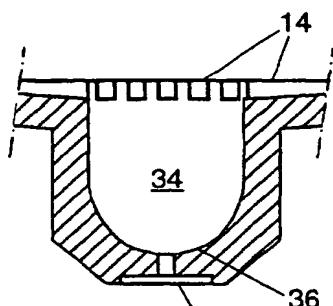
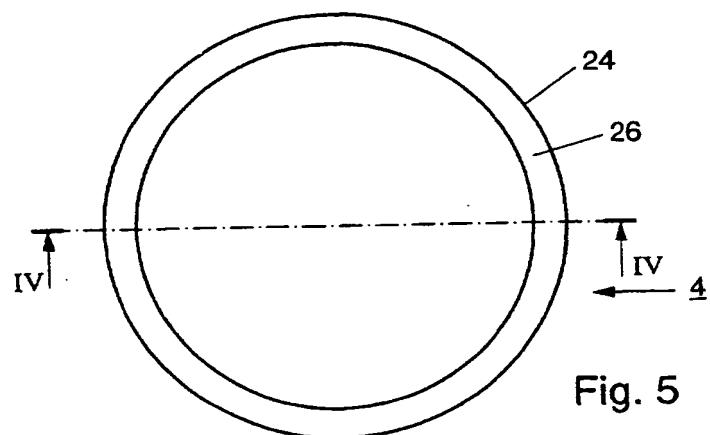
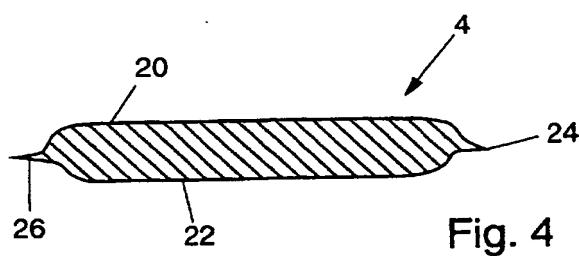
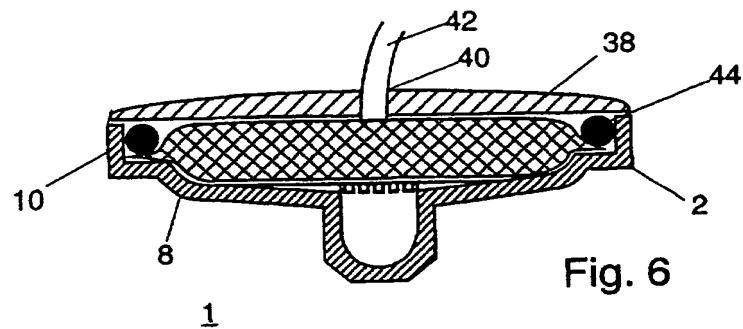


Fig. 3



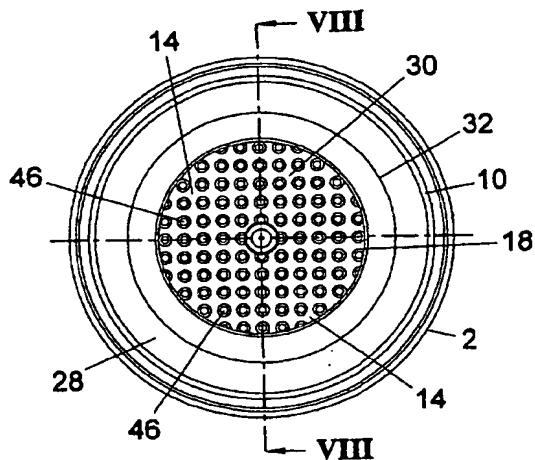


Fig. 7

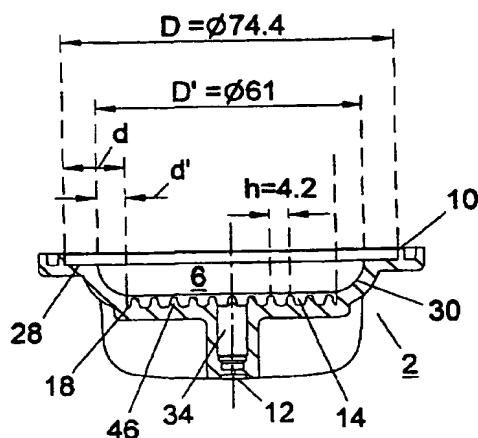


Fig. 8

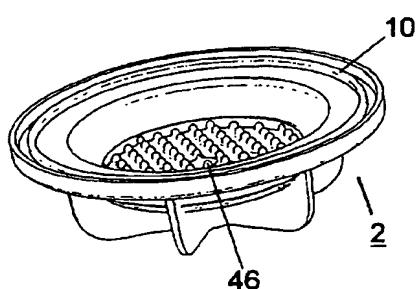


Fig. 9

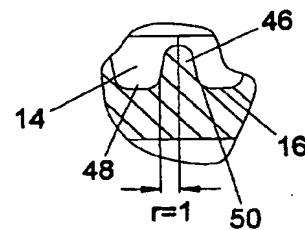


Fig. 10

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